

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions when selecting among the alternatives for meeting the purpose and need for action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2. Each alternative is analyzed in comparison with the no action alternative (Alternative 5) to determine whether the real or potential effects would be greater, less, or the same. Although each agency has the authority to make its own decision regarding the alternative to be selected, impacts are analyzed for each alternative as if all of the lead and cooperating agencies had selected the same alternative. This allows for analysis of the full range of potential impacts from the proposed alternatives while maintaining clarity and avoiding undue repetition. Impacts of the lead and cooperating agencies selecting differing alternatives will be intermediate to those presented in this chapter.

The following resource values within the State are not expected to be significantly impacted by any of the alternatives analyzed: geology, minerals, flood plains, wetlands, visual resources, prime and unique farmlands, timber, and range. These resources will not be analyzed further.

Cumulative Effects: Cumulative effects are discussed in relationship to each of the alternatives analyzed, with emphasis on potential cumulative effects from methods employed, and including summary analyses of potential cumulative impacts to target and non-target species, including T&E species.

Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and other materials, there are no irreversible or irretrievable commitments of resources.

Effects on sites or resources protected under the National Historic Preservation Act: The actions of the lead and cooperating agencies are not undertakings that could adversely affect historic resources (See Section 1.7.2)

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

4.1.1 Effects on DCCO Populations

The analysis for magnitude of impact on wildlife populations generally follows the process described in Chapter 4 of USDA (1997, Revised). Magnitude is described in USDA (1997, Revised) as “. . . a measure of the number of animals killed in relation to their abundance.” Magnitude may be determined either quantitatively or qualitatively.

Quantitative determinations are based on population estimates, allowable (i.e., “sustainable”) harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Measures to avoid adverse impacts on DCCO populations are described in Chapter 3.

Alternative 1 – Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

At present, maximum annual take of DCCOs for management of damage to aquaculture, public resources, private property, and risks to human health and safety and DCCO take for research projects would be identical to that described for Alternative 5. This similarity exists because all proposed PRDO projects are for the protection of sensitive vegetation and wildlife species. The USFWS could issue MBPs for this type of CDM. The only difference is that take for the protection of public resources would occur under the authority and procedures established for the PRDO (USFWS 2003). However, at a future time, this alternative would also allow for the lead and cooperating agencies to conduct actions for the protection of fishery resources so long as these projects do not reduce the local DCCO populations below the management objectives described in Section 1.5.6.3 and so long as these projects do not increase cumulative take and other impacts beyond the maximum levels analyzed in this EA. If projects for the protection of fishery resources were to occur, take under this alternative would be greater than Alternative 5, wherein projects for the protection of public fishery resources would be extremely limited. However, maximum annual take would remain the same for both Alternatives and would amount to a 48 to 61% reduction in the number of breeding DCCOs at WSINWR and a 49 to 57% reduction in the statewide population of DCCOs (assuming a conservatively estimated total state population of 13,000 DCCOs – see Tables 4-1, 4-2, and analysis of impacts for Alternative 5). The Preferred Alternative would reduce the Ohio breeding DCCO population to a range of between 1,921 and 2,421 breeding pairs. This is similar to the number of breeding birds that were counted in the state in 1999-2000. The density of DCCOs increased from that level to the current density of 5,164 pairs over the period of five to six years. As discussed in Section 1.8.4, the EA would be amended and public comment solicited if the lead and cooperating agencies propose to conduct CDM projects for the protection of fishery resources that would result in impacts greater than those analyzed in this EA. Analysis provided for Alternative 5 indicates that the proposed level of CDM would not adversely impact the viability of the state, regional or national DCCO population.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Under this alternative, the Federal agencies would not kill any DCCOs or destroy eggs because no lethal methods would be used. As discussed in Section 3.1, WS would not complete the WS Form 37 consultations needed before USFWS could issue depredation permits, and the USFWS would not issue MBPs. Local

governments, landowners and their designated agents (e.g., private damage management businesses) could only use non-lethal CDM techniques.

Under the PRDO the State does have the authority to take up to 10% of local breeding populations of DCCOs, with the consent of the land owner/manager, in order to protect public resources (USFWS 2003). ODW has indicated that it would use this authority on non-Federal lands. The USFWS would not permit lethal CDM techniques on WSINWR but non-lethal methods could be used to try and meet management objectives defined in Section 1.5.6.3. A maximum of 270 DCCOs could be taken by ODW under this alternative (Table 4-1). This is approximately 2% of Ohio's conservatively estimated summer DCCO population (see analysis of impacts for Alternative 5) and is a far lower level of take than would occur under Alternative 5. For reasons noted for Alternatives 5, the lead and cooperating agencies conclude that this alternative would not jeopardize the long-term sustainability of DCCO populations at the state, regional, or national level.

Alternative 3 – Only Technical Assistance from Federal Agencies

Under this alternative, WS would have no impact on DCCO populations in the State because WS would not conduct any operational CDM activities and would be limited to providing advice on CDM. WS would still be able to complete the WS Form 37 consultations needed before USFWS could issue depredation permits. Issuing permits is a kind of technical assistance, so the USFWS could still issue MBPs for research, damage to private property and risks to human health and safety. However operational damage management would have to be conducted by the permittee or their designated agent, ODW, local government, or private wildlife damage management companies because the Federal agencies would be prohibited from providing operational assistance with CDM.

The USFWS could also grant approval for PRDO projects that propose to take more than 10% of the local breeding DCCO population on non-Federal lands. Cormorant conflict management would not occur at WSINWR. The ODW has indicated that it will conduct the same level of CDM on non-Federal lands under this alternative as would occur under Alternatives 1 and 5. A maximum of 2,686 or approximately 21% of Ohio's conservatively estimated summer DCCO population (see analysis of impacts for Alternative 5) would be taken under this Alternative (Table 4-2). DCCOs would not be harassed or taken from WSINWR. This level of take is less than that under the no action and proposed alternatives but greater than that for Alternatives 2 and 4. For reasons noted for Alternatives 1 and 5, the lead and cooperating agencies conclude that this alternative would not jeopardize the long-term sustainability of DCCO populations at the state, regional, or national level.

Alternative 4 - No CDM by Federal Agencies

Under this alternative, the Federal agencies would have no impact on DCCO populations in the state. As discussed in Section 3.1, WS would not complete the WS Form 37s consultations needed before USFWS could issue depredation permits, and the USFWS would not issue MBPs. However, under the PRDO the state does have the authority to take up to 10% of local breeding population of DCCOs, with the consent of the land owner/manager, in order to protect public resources (USFWS 2003). The ODW has indicated that it would use this authority to take up to 270 DCCOs (2% of Ohio's conservatively estimated summer DCCO population - see analysis of impacts for Alternative 5). DCCOs would not be harassed or taken from WSINWR. Local governments, landowners and their designated agents (e.g., private damage management businesses) could only use non-lethal CDM techniques. Therefore the cumulative impact on DCCOs would be similar to Alternative 2 (Table 4-2) and would not jeopardize the long-term sustainability of DCCO populations at the state, regional, or national level.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

DCCOs range throughout North America, from the Atlantic coast to the Pacific coast (USFWS 2003). During the last 20 years, the DCCO population has expanded to an estimated 372,000 nesting pairs; with the U.S. population (breeding and non-breeding birds) conservatively estimated to be greater than 1 million birds (Tyson et al. 1999). The USFWS estimates the current continental population at approximately 2 million birds (USFWS 2003). Tyson et al. (1999) found that the DCCO population increased approximately 2.6% annually during the early 1990s. The greatest increase was in the Interior region with a 22% annual increase in the number of DCCOs in Ontario and the U.S. States bordering the Great Lakes (Tyson et al. 1999). The number of breeding pairs of DCCOs in the Atlantic and Interior population is estimated at over 85,510 and 256,212 nesting pairs, respectively (Tyson et al. 1999). From 1990 to 1997, the annual growth rate in the Interior population was estimated at 6% with the most dramatic increases occurring on Ontario, Michigan, and Wisconsin waters (Tyson et al. 1999, USFWS 2003). Nest counts in 2000 estimated 115,000 pairs in the Great Lakes (Weseloh et al. 2002). Lake Erie's breeding population increased from 174 to 26,542 breeding individuals from 1979 to 2000 (Hebert et al. 2005).

The Ohio population of DCCOs is primarily composed of birds from the Interior population (USFWS 2003, Tyson et al. 1999). Most DCCOs are found in Ohio during the spring, summer and fall months when the breeding population and migrating birds are present. The current Ohio breeding population of DCCOs started a consistent breeding colony in 1992 at WSI with 182 pairs. There had been a breeding population of DCCOs in the state prior to that time, but the use of organochlorine pesticides (e.g., DDT) caused marked declines in the nationwide

DCCO population and had temporarily resulted in no regularly nesting DCCOs in Ohio. Since the return of breeding DCCOs to Ohio in 1992, the number of cormorant colonies in the state has increased rapidly. In 2003, when the FEIS (USFWS 2003) was completed, there were 3 breeding colonies with a total of 3,049 breeding pairs (WSI 2,613 - pairs, TPI - 401 pairs, Grand Lakes, St. Mary - 35 pairs) and by 2005 there were 5 breeding colonies with a total of 5,165 breeding pairs (WSI - 3,813 pairs; TPI - 409 pairs; Green Island - 857 pairs; Grand Lakes, St. Mary - 80 pairs; Portage Lakes - 6 pairs; ODW 2005). This population estimate does not include sub-adults and nonbreeding birds. Estimates of 0.6 to 4.0 subadult DCCOs per breeding pair have been used for several populations (Tyson et al. 1999). Assuming 0.6 subadults and non-breeding individuals per breeding pair, the summer DCCO population in Ohio can conservatively be estimated at more than 13,000 birds. During migration, there are many additional DCCOs moving through the State.

Aerial waterfowl surveys of coastal and near shore inland marshes during fall migration (e.g., areas not used for nesting) provide some insight as to the number of DCCOs that may be migrating through the state. ODW conducts eight aerial waterfowl surveys between September 1 and December 15 each year within the coastal and near shore inland marshes of Ohio. From 1997 to 2004 anywhere between 788 and 4,950 DCCOs have been counted in any one survey (ODW data 2005). Similar surveys have not been conducted for the islands, but it is likely that they draw in many more DCCOs than the marshes due to the tendency of migrants to be attracted to the DCCOs already inhabiting the islands.

Estimated DCCO Take - Protection of Public Resources.

Some CDM activities to protect public resources could be conducted under MBPs. Depredation permits can be issued for the protection of sensitive plants and animals (e.g., co-nesting colonial waterbirds). Permits would probably not be issued for the protection of free-swimming fish populations, but permits could be issued for CDM at the specific sites where hatchery fish are being released (USFWS 2003). All cormorant management objectives proposed in Section 1.5.6.3 were established for the protection of vegetation and wildlife. These activities could be permitted under MBPs. The lead and cooperating agencies anticipate that to meet the management objectives set in Section 1.5.6.3, a maximum of 6,752 DCCOs could be taken in one year for the protection of birds, vegetation and other sensitive wildlife species (this number excludes birds taken for research, reduction of damage to property or aquaculture or reduction of risks to human health and safety; Table 4-1). This would be a 48 to 61% reduction in the number of breeding DCCOs at WSINWR and a 44 to 52% reduction in the statewide population of DCCOs (assuming a conservatively estimated total state population of 13,000 DCCOs). This level of take is unlikely to occur because at least some of the birds are anticipated to respond to non-lethal frightening devices and/or the use of lethal techniques on other DCCOs and leave the site without being shot. Similar projects conducted in other areas have indicated that many

birds will disperse from the damage management site to other breeding colonies throughout the region (USFWS 2003). Additionally, the number of DCCOs to be taken annually is anticipated to be higher during initial years of the project than when DCCO colonies are close to management objectives.

Table 4-1. Number of DCCOs that could be lethally removed annually under each alternative for the protection of vegetation and wildlife in the public domain. DCCO population numbers for each site only include breeding adults and do not include sub-adults and non-breeding birds.

Site	Target Popn. ¹	Annual Maximum Take Alt 1	Annual Maximum Take Alt. 2 ⁴	Annual Maximum Take Alt. 3	Annual Maximum Take Alt. 4 ⁴	Annual Maximum Take Alt. 5
West Sister Island (7,626 breeding adults in 2005)	3,000-4,000	3,626 - 4,626	0	0	0	3,626 - 4,626
Turning Point Island (818 breeding adults in 2005)	800	80 ²	80 ²	80 ²	80 ²	80 ²
Green Island (1,714 breeding adults in 2005)	0	1,714	172	1,714	172	1,714
Grand Lakes, St. Mary (160 breeding adults in 2005)	30	130	16	130	16	130
Portage Lakes (12 breeding adults in 2005)	12	2 ²	2 ²	2 ²	2 ²	2 ²
Migrants – All Sites ³		200	0 ind. ⁴	60 ind. ⁵	0 ind. ⁴	200
Total	3,842 – 4,842	5,752 – 6,752	270	1,986	270	5,752 – 6,752

1. Target DCCO numbers based on management objectives defined in Section 1.5.6.3.
2. Maximum take anticipated to maintain current conditions.
3. Estimated number of birds that might be taken to reinforce harassment of migrating birds.
4. The state is allowed to take up to 10% of the breeding DCCO population under the PRDO without having to obtain permission from the USFWS. That level of take is accounted for in the above estimates for the sites where ODW will work during the breeding season.
5. CDM would not be conducted at WSI so the overall need to use shooting to reinforce harassment of migrating birds would be reduced. Estimated take was reduced proportionally to occurrence of breeding pairs.

Estimated DCCO Take – All Other Sources

Over the last three years, fewer than 300 DCCOs have been taken per year under MBPs for the reduction of damage to aquaculture and private property and for

reduction in risks to human health and safety at airports. The highest number of DCCOs requested under scientific collecting permits in recent years was a request for 500 birds in 2005 for projects relating to DCCO damage at WSI and Green Island. (Table 4-2).

Table 4-2. Number of DCCOs that could be lethally removed annually under each alternative through all means.

Type of Take	Annual Take Alt 1	Annual Take Alt. 2	Annual Take Alt. 3	Annual Take Alt. 4	Annual Take Alt. 5
PRDO ¹	5,752 – 6,752	270	1,986	270	
Scientific Collecting Permits ²	300	0	500	0	300
MBPs – Damage to Property and Aquaculture, Risks to Health and Safety ³	300	0	300	0	300
MBPs – Damage to Public Resources ¹	0	0	0	0	5,752 – 6,752 ind.
Total (Cumulative) Take	6,352-7,352	270	2,786	270	6,352 – 7,352

¹ Totals are from Table 4-1 above.

² Five hundred birds were taken under scientific collecting permits in 2005. This number was reduced for Alternatives 1 and 5 because some of the birds taken for damage management are likely to be used for research.

³ Estimate based on CDM under MBPs in prior years plus some extra based on anticipated need for CDM in the future

Nationwide, the FEIS predicted that the implementation of the AQDO, PRDO, and issuance of migratory bird permits would affect approximately 8% of the continental DCCO population on an annual basis (USFWS 2003). Assuming an equitable distribution of take among the 24 states in which the PRDO applies, this is an average of about 6,650 birds per State. This would be about 51% of the current estimated summer DCCO population in Ohio of 13,000 birds and a smaller but unknown percentage of all DCCOs (residents and migrants) occurring within the State. The FEIS concluded that the proposed level of take would be sustainable at the State level (USFWS 2003). Take under this alternative would be the same as anticipated if the PRDO were to be implemented because all proposed take is for the protection of sensitive wildlife and plant species and could be permitted under MBPs. However, at a future time, the lead and cooperating agencies could conduct actions for the protection of fishery resources so long as these projects do not increase cumulative take and other impacts

beyond the maximum levels analyzed in this EA and so long as these projects do not reduce the local DCCO populations below the management objectives described in Section 1.5.6.3. In these instances actual take for this alternative would be less than Alternative 1, but the maximum potential take anticipated for each alternative would not change.¹

Maximum cumulative take in Ohio under this alternative (7,352 birds per year) exceeds the 6,650 birds per year that could be taken per state if the total take predicted in the USFWS EIS is divided evenly among all states covered in the PRDO. However, it is important to note that DCCOs and DCCO damage are not evenly divided among all states. Some states like Iowa, Illinois and Indiana may never have many DCCO problems or take many DCCOs. Other states like Ohio may have higher populations of DCCOs and higher than average predicted DCCO removal without adversely impacting the long-term sustainability of the regional DCCO population or exceeding parameters stipulated by the USFWS EIS (2003). This action would reduce the Ohio breeding DCCO population to 1,921 to 2,421 breeding pairs. This is similar to the number of breeding birds that were counted in the state in 1999-2000. The density of DCCOs increased from that level to the current density of 5,164 pairs over the period of five to six years. Therefore, we conclude that this alternative would not threaten the long-term sustainability of breeding DCCOs at the state, regional or national level.

DCCOs are protected by the USFWS under the MBTA. Therefore, DCCOs are taken in accordance with applicable Federal laws and regulations authorizing take of migratory birds and their eggs or young, including the USFWS Public Resource Depredation Order (PRDO) (50 CFR 21.48), and the USFWS permitting processes. DCCOs are not a State-protected species in Ohio and the State does not require permits in addition to those that must be received from the USFWS. The USFWS, as the agency with migratory bird management responsibility, will impose restrictions on DCCO management at the State, regional, and national levels as needed to assure cumulative take does not adversely affect the long-term sustainability of populations (USFWS 2003, Appendix G). WS and ODW will report all CDM activities and the USFWS will ensure that cumulative take does not exceed that which can be sustained by the population.

Based upon the above information, the lead and cooperating agencies have determined that the impacts to the Ohio DCCO population from this alternative would not jeopardize the long-term sustainability of DCCO populations at a state, regional, or national level.

¹ The EA would be amended and public comment solicited before the lead and cooperating agencies conduct any future projects under the PRDO that would increase the cumulative impacts of CDM activities.

4.1.2 Effects on Other Fish and Wildlife Species, Including Threatened and Endangered Species

Alternative 1 - Integrated CDM Program Including Implementation of the PRDO (Preferred Alternative)

Adverse Impacts on Non-target Species Including Threatened and Endangered Species Impacts would be similar to the no action alternative. All of the management objectives in Section 1.5.6.3, were established for the purpose of protecting wildlife and vegetation. Under Alternative 5, it would be possible to obtain MBPs for these actions. Therefore the amount of CDM and the methods available are identical to Alternative 5. However, if at a future time, data become available indicating that a new management objective would be beneficial for the protection of public fishery resources, that type of work could be conducted under this alternative. The Federal agencies would not conduct or approve projects for the protection of public fishery resources that would lead to increases in take, decreases in population management goals, or other adverse environmental impacts beyond what is already analyzed in this EA without supplementing the EA (Section 1.8.4). All SOPs in Chapter 3 and other provisions for protecting non-target species, including any recommendations and requirements resulting from Section 7 consultation with the USFWS and consultation with ODW, will be identical to Alternative 5. Therefore, the lead and cooperating agencies conclude that this alternative would not have a cumulative adverse impact on non-target species.

Beneficial Impacts on Non-target Species Including Threatened and Endangered Species The PRDO was established to allow for CDM activities specifically designed to benefit non-target species including co-nesting birds, vegetation and fisheries. CDM programs can benefit those wildlife species that are adversely impacted by DCCO predation, DCCO competition for habitat, and/or the impact of large DCCO colonies on vegetation (Sections 1.5.1, 1.5.6.1). Under this alternative CDM would be conducted to protect great blue herons, State-listed black-crowned night-herons, great egrets and cattle egrets, the State- and Federally-listed Lake Erie watersnake, and rare plant communities, particularly those occurring on Green Island, from adverse impacts associated with high densities of DCCOs. Lead and cooperating agency experience with non-lethal and lethal CDM techniques indicates that an integrated CDM approach that allows access to all legal CDM methods has the greatest likelihood of rapidly achieving DCCO management objectives for the Ohio colonies.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Adverse Impacts on Non-target Species Including Threatened and Endangered Species from CDM The Federal agencies would be restricted to the use of non-lethal techniques. Consequently, there would be no risks from Federal use of lethal CDM techniques. The USFWS would also not issue MBPs for DCCO

management. However, under the PRDO the state does have the authority to take up to 10% of local breeding population of DCCOs, with the consent of the land owner/manager, in order to protect public resources (USFWS 2003). ODW has indicated that it would use this authority on non-Federal lands. The USFWS would not permit lethal CDM techniques on WSINWR.

The primary risk to non-target species from the use of non-lethal techniques is the risk of disturbing co-nesting species during harassment, nest destruction and other non-lethal CDM activities as described for the no-action alternative. As discussed in Section 1.5.6.3 the lead and cooperating agencies will conduct research on the impacts of DCCO removal on co-nesting species. Given the data available, the SOPs established for the protection of non-target species, and the fact that the agencies will continue to evaluate impacts on non-target species and adjust management techniques accordingly, the use of frightening devices proposed in this alternative will have a low magnitude of impact on non-target species.

Without even the minor use of lethal techniques to reduce habituation to nonlethal CDM methods (DCCOs getting used to and not responding to frightening devices), this alternative will likely require more hours of non-lethal CDM than Alternatives 1 and 5 in order to achieve similar management objectives, therefore the risk of disturbing co-nesting species will be greater for this alternative than for alternatives 1 and 5. Given the tendency of DCCOs to habituate to frightening devices, it may not be possible to achieve the same level of CDM as with Alternatives 1 and 5. Success in achieving management objectives may be more likely on non-Federal lands where ODW would have limited access to lethal CDM techniques. However, it is likely to take longer for ODW to achieve management objectives than under Alternatives 1 and 5.

The lead and cooperating agencies will continue to utilize SOPs for harassment activities as discussed in Chapter 3 and for Alternative 5 in order to reduce potential impacts on listed (Federal and State) and non-listed species. Therefore, risks associated with ODW's use of lethal CDM alternatives under this alternative would be similar to Alternative 5, but overall impact would be lower than Alternative 5 because less lethal CDM would be conducted.

Beneficial Impacts on Non-target Species Including Threatened and Endangered Species. This alternative would allow for the use of non-lethal techniques to protect public resources. Management objectives would remain the same for this alternative as for Alternatives 1 and 5. However, as discussed above the lead and cooperating agencies are concerned that they may not be able to achieve CDM objectives with the exclusive use of non-lethal techniques. This is especially true for the Lake Erie island colonies where the management objective is to rapidly reduce the local DCCO population from 5,070 to 2,950 breeding pairs.

Alternative 3 – Only Technical Assistance by Federal Agencies

Adverse Impacts on Non-target Species Including Threatened and Endangered Species from CDM. Under this alternative, the lead and cooperating agencies would not conduct operational CDM. WS would still be able to complete the WS Form 37 consultations needed before USFWS could issue MBPs. The USFWS would also have the ability to approve CDM projects that propose to take more than 10% of the local breeding DCCO population. Therefore, it would still be possible for ODW to conduct CDM under the PRDO, but it would not receive any operational assistance from the USFWS or WS. Additionally, CDM would not be conducted at WSINWR. The tools that could be used for CDM would not differ from Alternatives 1 and 5. However, because the PRDO will not be implemented on Federal lands, the amount of CDM that could be conducted would be lower than for Alternative 5. Therefore, this alternative is likely to have a lower level of risk to non-target species than the already low level discussed for Alternative 5.

Beneficial Impacts on Non-target Species Including Threatened and Endangered Species. Projects to protect wildlife and plants on non-Federal lands would likely be identical to Alternatives 1 and 5. However, CDM efforts at these sites may be complicated by the lack of CDM at WSINWR. WSINWR may serve as a refuge for birds harassed from the other Lake Erie sites. Birds at WSINWR may also serve as a source population for reinvasion of the non-Federal sites.

In the absence of CDM, DCCO densities and associated damage to habitat and adverse impact on other wildlife species are likely to continue. Given the pattern of DCCOs moving from nesting sites on trees that have died to nearby healthy trees observed by Hebert et al. (2005), even if DCCO densities do not increase beyond current levels, vegetation loss is likely to continue. Cormorant conflict management efforts at non-Federal sites are likely to exacerbate problems on WSI because birds are likely to move to the site with no CDM. Overall beneficial impacts on non-target species would likely be much lower than for Alternatives 1 and 5.

Alternative 4 - No CDM by Federal Agencies.

Adverse Impacts on Non-target Species Including Threatened and Endangered Species from CDM. Under this alternative, the Federal agencies would not participate in CDM. The USFWS would not issue MBPs and would not grant approval for PRDO projects proposing to take more than 10% of a local DCCO population. As with Alternative 2, under the PRDO the state does have the authority to take up to 10% of a local breeding population of DCCOs, with the consent of the land owner/manager, in order to protect public resources (USFWS 2003). ODW has indicated that it would use this authority on non-Federal lands. The USFWS would not permit lethal CDM techniques on WSINWR. The state, local governments, landowners and their designated agents (e.g., private damage

management businesses) could use non-lethal CDM techniques on non-Federal lands. The amount of CDM that could be conducted would be much lower than for Alternative 5. Unlike Alternative 2, non-lethal CDM would not be conducted on Federal lands (e.g., at WSINWR). Therefore, this alternative is likely to have a reduced level of risk to non-target species than the already low level discussed for Alternative 5.

Beneficial Impacts on Non-target Species Including Threatened and Endangered Species. Management objectives for activities to protect wildlife and vegetation on non-Federal lands would be the same as all the other alternatives. The ability to achieve the management objectives will be limited by the restrictions on the number of DCCOs that can be taken using lethal methods, lack of assistance from WS, and further complicated by the lack of CDM on WSINWR (as with Alternative 3). Conversely, like Alternative 3, CDM activities on non-Federal lands and the lack of CDM on WSINWR is likely to exacerbate adverse impacts of DCCOs on vegetation and other species of wildlife using the site. Overall benefits to non-target species are lowest for this alternative.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Adverse Impacts on Non-target Species (Not Threatened or Endangered Species). Direct impacts on non-target species occur when program personnel inadvertently kill, injure, or harass animals that are not target species, including eggs or young of nesting adults that are disturbed by CDM activities. The most likely negative effect on non-target species from CDM activities in Ohio is disturbance of co-nesting colonial waterbirds. If adults are startled from the nest for too long or at the wrong time of day, there is potential for increased mortality rates for eggs and chicks. However, in most instances, migratory birds and other affected non-target wildlife may temporarily leave the immediate vicinity of scaring, but usually return after conclusion of the action. Moore et al. (2005) evaluated the impact of DCCO removal on co-nesting great blue herons and great egrets on Lake Ontario. For both species, there was no impact on the proportion of time spent in nest attendance between control and treatment sites for the interval prior to DCCO removal, the intervals between DCCO removal efforts and the period after DCCO removal was completed. Nest attendance declined for both species during the DCCO removal periods (35 ± 20 min). Herons disturbed during the DCCO removal returned to the nest in 11 - 14 min (longest unattended= 50 ± 30 min) and all egrets returned to nests before the cormorant removal had ended (longest unattended= 6 ± 4 min). There was no difference in the nest success of herons or egrets between treated and untreated sites. These findings are similar to those of a study conducted on WSI and Green Island in 2005. Take of DCCO from WSI in 2005 under a scientific collecting permit showed little effect on the island's breeding population. Rifles with and without silencers were used to remove a total of 363 double-crested cormorants from 28 test plots (25 meter radius) on WSI in May, 2005. Observers accompanied shooters to record any possible

disturbance to other nesting birds. Only one great egret was seen flushing off its nest during the removal operation. As discussed in Section 1.5.6.3 the lead and cooperating agencies would continue to monitor the impacts of DCCO removal on co-nesting species. Precautions used to minimize the likelihood and duration of impacts on co-nesting birds are listed in the SOPs in Chapter 3.

It is extremely unlikely that a non-target species would be shot. No non-target birds or mammals have been killed by WS during CDM operations in Ohio (MIS 2005 database). Non-target species caught in live-traps and nets would be released. While every precaution is taken to safeguard against taking non-target birds, at times changes in local flight patterns and other unanticipated events can result in the incidental take of unintended individuals. These occurrences are rare and should not affect the overall populations of any species under the proposed program. Mitigation measures to reduce potential impacts to non-target species, especially nesting birds, are listed in Chapter 3.

Given the data available, the SOPs established for the protection of non-target species, and the fact that the agencies will continue to evaluate impacts on non-target species and adjust management techniques accordingly, the use of frightening devices proposed in this alternative will have a low magnitude of impact on non-target species.

Beneficial Impacts on Non-target Species (Not Threatened or Endangered Species). This alternative allows the USFWS to issue MBPs for the protection of sensitive vegetation and animals (e.g., co-nesting birds, rare plant communities). Programs to control DCCO damage can reduce negative competition for resources with co-nesting colonial waterbirds and can decrease adverse impacts on vegetation which benefits the vegetation and the wildlife that uses the vegetation (Sections 1.5.1, 1.5.6.1). Under this alternative, actions to protect free-swimming fish populations would be limited and the impact on free-swimming fish would likely be minimal. However, since the management objectives for the proposed project were established for the protection of co-nesting birds and rare plant communities, the USFWS could issue permits for the CDM proposed in this EA. Section 1.5.6.3 provides the reasoning on why the lead and cooperating agencies believe the proposed level of CDM would benefit wildlife and vegetation in Ohio. Experience by the lead and cooperating agencies indicates that an integrated CDM program as would be permitted under this alternative would have the greatest potential to achieve management goals.

Threatened and Endangered Species Impacts. Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential risks and the establishment of special restrictions or mitigation measures to minimize or negate any risks. Mitigation measures to avoid adverse T&E effects are described in Chapter 3.

Federally-listed Species. A summary of Federally-listed T&E species in Ohio is provided in Appendix B. The USFWS completed an Intra-Service Section 7 Biological Evaluation on the management of DCCOs in the U.S. for the FEIS (USDI 2003). The only species in the national consultation that could potentially be impacted by CDM actions in Ohio are the piping plover (migrant only), bald eagle, and Lake Erie watersnake (USFWS 2003). An additional Intra-Service Section 7 Biological Evaluation was conducted specific to CDM actions in Ohio. All recommendations from the Ohio Intra-Service Section 7 Biological Evaluation have been incorporated into the SOPs for CDM. The following is a list of conservation measures to reduce risks of adverse impacts on bald eagles and piping plovers from the national consultation likely to be applicable to CDM in Ohio:

- (i) Discharge/use of firearms to kill or harass DCCOs or use of other harassment methods are allowed if the control activities will occur more than 1,000 feet from active piping plover nests or colonies and migrating plovers, and more than 750 feet from active bald eagle nests.
- (ii) Other control activities such as egg oiling, cervical dislocation, CO₂ asphyxiation, egg destruction, or nest destruction are allowed if these activities occur more than 500 feet from active piping plover nests or colonies and migrating plovers, and more than 750 feet from active bald eagle nests.
- (iii) To ensure adequate protection of piping plovers, any agency or its agents who plan to implement control activities that may affect areas designated as piping plover critical habitat in the Great Lakes Region are to make contact with the appropriate Regional Migratory Bird Permit Office prior to implementing control activities.

The lead and cooperating agencies will abide by the final conservation measures in the Intra-Service Section 7 Biological Evaluation for Ohio to avoid risks to bald eagles, piping plovers and Lake Erie watersnakes. Because the proposed level of CDM is intended to protect vegetation on the Ohio Lake Erie Islands, this action is likely to be beneficial to the Lake Erie watersnake by protecting its habitat (Section 1.5.6.1). (See also Appendix H for USFWS management guidelines for the Lake Erie watersnake.) Therefore, the USFWS determined that the preferred alternative will not adversely affect any federally-listed T&E species or critical habitat in Ohio.

State-listed Species. The State list of endangered and threatened species is provided in Appendix C. The lead and cooperating agencies have determined that CDM has the potential to affect the black-crowned night-heron, snowy egret, cattle egret, bald eagle, Lake Erie watersnake

(discussed above under federally-listed species), elegant sunburst lichen, northern bog violet, Sprengel's sedge, tufted fescue sedge, harebell and rock elm. Prior to any control action, the lead and cooperating agencies will consult with the ODW to ensure that no actions taken under this plan will adversely affect Ohio's listed threatened and endangered species. Actions to minimize risks to these species are described above and in the section on SOPs in Chapter 3. Because the proposed level of CDM is intended to protect vegetation on the Ohio Lake Erie islands, this action is likely to have a beneficial impact on State-listed bird species by virtue of protecting their habitat and is also likely to benefit the State-listed plant species, especially the rock elm which is located in the portion of Green Island that is currently being used by nesting DCCOs. The lead and cooperating agencies conclude that with the mitigation measures described here and in Chapter 3, this alternative will not adversely impact State-listed species.

4.1.3 Effects on Human Health and Safety

4.1.3.1 Effects on Human Health and Safety from CDM Methods

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

The CDM methods to be used are identical to Alternative 5. Risks to human health and safety associated with these methods would be similar to Alternative 5.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Under this alternative, CDM methods that might raise safety concerns include shooting with firearms when used as a harassment technique and harassment with pyrotechnics. The ODW would still use firearms as a lethal CDM technique to take up to 10% of local DCCO populations for the protection of public resources on non-Federal lands. Risks associated with these methods are identical to those for Alternative 1. However, there will likely be greater use of harassment techniques than for Alternative 1. Given the training and experience of lead and cooperating agency personnel conducting CDM, risks to human health and safety are anticipated to be very low.

The State, local governments, landowners and their designated agents (e.g., private damage management businesses) could still use pyrotechnics or firearms in CDM programs and this activity would likely occur to a greater extent in the absence of access to lethal CDM techniques. Hazards to humans and property could be greater under this alternative if personnel conducting CDM activities have less training and experience than personnel with the lead and cooperating agencies. However, the lead and cooperating agencies would be able to provide advice and information on the safe and proper use of these methods so risks

should be less than Alternative 4. Overall risks to human health and safety are still likely to be low, but might be higher than with Alternative 5.

Alternative 3 – Only Technical Assistance by Federal Agencies

Under this alternative, the Federal agencies would not engage in direct operational use of any CDM methods. Risks to human safety from Federal use of firearms and pyrotechnics would hypothetically be lower than the no action alternative, but not much because the current program has an excellent safety record in which no accidents involving the use of these devices have occurred that have resulted in a member of the public being harmed. The State would still be able to use lethal CDM techniques for the protection of public resources on non-Federal lands. Risks associated with these activities would be similar to Alternative 5 or slightly lower because use of lethal CDM would not be permitted on WSI.

The State, local governments, landowners and their designated agents (e.g., private damage management businesses) could still use pyrotechnics or firearms in CDM programs. Use of these methods by individuals with less training than the lead and cooperating agencies would likely occur to a greater extent in the absence of operational assistance from WS than with Alternative 5. Hazards to humans and property could be greater under this alternative if personnel conducting CDM activities have less training and experience than personnel with the lead and cooperating agencies. However, the lead and cooperating agencies would be able to provide advice and information on the safe and proper use of these methods so risks should be less than Alternative 4. Overall risks to human health and safety are still likely to be low, but might be higher than with Alternative 5.

Alternative 4 - No CDM by Federal Agencies

Under Alternative 4, the Federal agencies would not be involved in CDM activities in Ohio so there would be no risks from their use of firearms or pyrotechnics. The State would still be able to use lethal CDM techniques to take up to 10% of local DCCO populations for the protection of public resources. Risks associated with lethal CDM by the ODW will be similar to or slightly lower than Alternative 5 because less lethal CDM will be conducted.

The State, local governments, landowners and their designated agents (e.g., private damage management businesses) could still use pyrotechnics or firearms in CDM programs and this activity would likely occur to a greater extent because access to lethal CDM methods would be extremely limited and no operational assistance would be available from WS. Hazards to humans and property could be greater under this alternative if personnel conducting CDM activities have less training and experience than personnel with the lead and cooperating agencies. The lead and cooperating agencies would not be able to provide advice and information on the safe and proper use of these methods so risks may be greater

than Alternative 5. Overall risks to human health and safety are still likely to be low, but may be higher than with Alternative 5.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

CDM methods that might raise safety concerns include shooting with firearms and harassment with pyrotechnics. Firearms and pyrotechnics would only be used by lead and cooperating agency personnel who are trained and experienced in the safe and legal use of firearms. WS personnel regularly receive refresher safety training to keep them aware of safety concerns and the other agencies have similar training requirements. There have been no accidents involving the use of firearms or pyrotechnics in which a member of the public was harmed by the lead or cooperating agencies. A formal risk assessment of WS' operational management methods found that when used in accordance with applicable laws, and WS regulations, policies and directives, risks to human safety were low (USDA 1997, Revised, Appendix P). Therefore, no adverse effects on human safety from use of these methods are expected. Agents acting under the authority of the lead and cooperating agencies will be informed and trained in the safe and proper use of CDM methods including the use of firearms. Additionally, when firearms or pyrotechnics will be used in CDM activities agency personnel may establish a safe perimeter around the colonies and detour boat traffic away from those areas. In 2005, when research on CDM methods was being conducted at WSI, the USFWS had a marked USFWS boat circling the island during the entire shooting period. The USFWS also broadcast a notice to mariners broadcast over Channel 16 VHF radio to warn boaters to stay one mile away from the island. The USFWS plans to do the same for all management trips and similar measures are likely to be used by ODW.

Local governments, landowners and their designated agents (e.g., private damage management businesses) can use pyrotechnics or firearms in non-lethal CDM programs without permits from the USFWS. Hazards to humans and property could be greater under this alternative if personnel conducting CDM activities have less training and experience than personnel with the lead and cooperating agencies. However, under this alternative, personnel from the lead and cooperating agencies would be able to provide technical assistance on the safe and effective use of this technique. Some individuals may choose to have the non-lethal CDM conducted by WS or ODW rather than doing it themselves which may also reduce risks associated with improper use of these methods. Overall risks to human health and safety are likely to be low.

4.1.3.2 Effects on Human Health and Safety from Not Conducting CDM

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

Impacts would be similar to the no action alternative. Activities to address risks to human health and safety would not differ between the two alternatives.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Under this alternative, the lead and cooperating agencies would be restricted to implementing and recommending only non-lethal CDM methods. As discussed in Chapter 3, the USFWS would not be able to issue MBPs for the use of lethal techniques to address risks to human health and safety from DCCOs. The success or failure of the use of non-lethal methods can be quite variable. In some situations the implementation of non-lethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other sites not previously affected. However, if the lead and cooperating agencies are providing direct operational assistance in relocating DCCOs, coordination with local authorities will be conducted to assure they do not re-establish in other undesirable locations. This alternative is unlikely to be as effective in reducing DCCO risks to human health and safety because there are some situations, like those at airports, where non-lethal techniques may not provide a sufficiently rapid or controlled response from the target bird(s) or where non-lethal techniques are not effective because the target animal has habituated to the frightening stimulus. Overall risks to human health and safety would be slightly greater under this alternative than Alternative 5.

Alternative 3 – Only Technical Assistance by Federal Agencies

Under this alternative, the lead and cooperating agencies would be restricted to providing technical assistance on CDM methods. WS would be able to assist with the WS Form 37 required for the USFWS to issue MBPs. Potential impacts would be variable. With technical assistance but no direct operational assistance, entities requesting CDM assistance for human health concerns would either take no action, which means the risk of human health problems would likely continue or increase in each situation as bird numbers are maintained or increased, or implement recommendations from the lead and cooperating agencies for non-lethal and lethal control methods. Depending on the training and experience of the individuals or entities that implement CDM actions, their efforts may not be as efficient or effective as programs conducted by the lead and cooperating agencies. This potential risk would be less likely under this alternative than Alternative 4 when people requesting assistance receive and accept technical assistance recommendations.

In some situations the implementation of non-lethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other sites not previously affected. This potential risk would be less likely under this alternative than Alternative 4 when people requesting assistance receive and accept technical assistance recommendations. Overall risks to human health and safety would be greater under this alternative than Alternative 5.

Alternative 4 - No CDM by Federal Agencies

Under this alternative, the lead and cooperating agencies would not participate in CDM. As discussed in Chapter 3, the USFWS would not be able to issue MBPs for the use of lethal techniques to address risks to human health and safety from DCCOs. CDM by entities other than the lead and cooperating agencies would be limited to non-lethal techniques. Resource owners and managers would be responsible for developing and implementing their own CDM program. Efforts by these individuals to reduce or prevent conflicts could result in less experienced persons implementing control methods, therefore leading to a lesser likelihood of reducing DCCO hazards, than under the Preferred Alternative. As discussed for Alternative 2, there may be some situations where non-lethal techniques are not adequate to reduce the risk to human health and safety. In other situations the implementation of non-lethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to sites not previously affected. Under this alternative, human health problems could increase if affected individuals were unable to find and implement effective means of controlling DCCOs that cause damage problems. Overall risks to human health and safety would be greatest under this alternative.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

People are concerned with potential injury, illness, and loss of human life resulting from damage and conflicts associated with DCCOs (Sections 1.4.5 and 1.5.5). DCCOs can be a threat to aviation safety and there is also concern about potential disease risks associated with accumulations of fecal material. In most cases, it is difficult to conclusively prove that DCCOs were responsible for transmission of individual human cases or outbreaks of bird-borne diseases. Nonetheless, certain requesters of CDM service may consider this risk to be unacceptable and may request such service primarily for that reason. In such cases, CDM, either by lethal or non-lethal means, would, if successful, reduce the risk of bird-borne disease transmission at the site for which CDM is requested. An Integrated CDM strategy combining lethal and non-lethal means, has the greatest potential for successfully reducing risks to aviation and human health and safety. An IWDM approach reduces damage or threats to public health or safety for people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical. For example, it may be necessary to use

lethal methods to remove DCCOs that had habituated or were not responding to frightening devices from the path of an airplane.

In some situations the implementation of non-lethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other sites not previously affected. In such cases, lethal removal of the birds may actually be the best alternative from the standpoint of overall human health concerns in the local area. If the lead and cooperating agencies are providing direct operational assistance in relocating DCCOs, coordination with local authorities will be conducted to assure that they do not reestablish in other undesirable locations.

4.1.4 Effects on Aesthetic Values

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

Individuals opposed to the use of lethal CDM techniques would be as opposed to this alternative as they are to Alternative 5 because the number of DCCOs that could be removed is the same for the two alternatives. However, the Preferred Alternative will not jeopardize the DCCO population and DCCO viewing opportunities will still be available. In most cases, CDM activities will reduce but not eliminate local DCCO populations. Green Island is the only site where the lead and cooperating agencies propose to stop the use of the site by breeding DCCOs. However, DCCO viewing opportunities would still be available on nearby islands. If proposed management objectives were met for the Lake Erie island colonies (WSI, TPI, and Green Island), there would still be 1,900 to 2,400 breeding pairs of DCCOs plus associated juveniles and non-reproductive individuals for people recreating on Lake Erie to view and enjoy.

Positive impacts on the opportunity to enjoy vegetation and co-nesting species of birds that can be negatively impacted by high numbers of DCCOs would be greatest under this alternative and Alternative 5 because these alternatives are anticipated to have the greatest beneficial impacts on non-target species (Section 4.1.2).

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Under this alternative the Federal agencies would only use non-lethal CDM techniques. People who oppose lethal control of wildlife by government but are tolerant of government involvement in non-lethal wildlife damage management might favor this alternative, especially since no lethal CDM would be conducted at WSI. However, some lethal CDM would still be conducted by ODW under the PRDO on non-Federal lands. People who have developed affectionate bonds with individual wild birds would be less affected by the death of individual birds than under Alternative 5, but might still be

opposed to the dispersal or translocation of certain birds. On the Lake Erie island colonies, the ability of individuals to enjoy viewing DCCOs would not differ from Alternative 5 in that the management goals of the projects would remain the same. However, the fate of some of the birds would be different since there would be much less use of lethal CDM techniques.

This alternative would allow the lead and cooperating agencies to conduct work under the PRDO. This alternative would reduce the negative aesthetic impacts of DCCOs on birds, vegetation and fisheries resources if non-lethal methods were effective in reducing such damage to acceptable levels. However, as stated in Section 4.1.2, non-lethal methods are not always effective and, so this alternative is not anticipated to be as effective in reducing negative impacts of DCCOs on non-target species as Alternative 1. However, Alternative 2 maybe more effective in protecting benefits of public resources than Alternative 5 because this alternative would still allow for action under the PRDO and therefore could be used to protect public fishery resources.

Alternative 3 – Only Technical Assistance by Federal Agencies

Under this alternative, the Federal agencies would be restricted to providing technical assistance on CDM methods. WS would be able to assist with WS form 37 required for the USFWS to issue MBPs. People opposed to direct operational assistance in CDM by the government might prefer this alternative to Alternative 5 especially because no CDM would be conducted on Federal lands. However, the ODW would still be able to conduct CDM under the PRDO including the use of lethal CDM techniques on non-Federal lands. Persons concerned about the welfare of individual birds and opposed to the use of lethal control would likely be opposed to this alternative because lethal control could be conducted by ODW and other non-Federal entities.

Under this alternative, the lack of operational assistance in reducing negative DCCO impacts at WSI could result in an increase in adverse affects on aesthetic values. Beneficial impacts of this alternative on the opportunity to enjoy vegetation and co-nesting birds on non-Federal sites would be similar to Alternatives 1 and 5.

Alternative 4 - No CDM by Federal Agencies.

Under this alternative, the Federal agencies would not conduct any CDM in Ohio. People opposed to any government involvement in CDM would favor this alternative. People concerned about the welfare of individual birds or the use of lethal CDM would prefer this alternative over alternative 5 because the lethal removal of DCCOs would be lower. However, entities other than the lead and cooperating agencies could still use non-lethal techniques and some individuals might oppose dispersal or translocation of certain birds.

Under this alternative, the lack of operational assistance in reducing negative DCCO impacts on vegetation, birds and fish could result in an increase in adverse affects on aesthetic values. The PRDO would only be implemented by ODW, and ODW's actions would be limited to take of up to 10% of the local DCCO population on non-Federal lands. Beneficial impacts of this alternative on the opportunity to enjoy vegetation, birds, or fisheries resources that are negatively affected will be much lower than Alternative 1.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Some people who routinely view individual birds or flocks of DCCOs would likely be disturbed by removal of such birds. Some people are morally or philosophically opposed to the killing of any birds. The lead and cooperating agencies are aware of such concerns and take this into consideration when planning CDM activities. Under the current program, lethal removal of DCCOs would continue and these persons would continue to be opposed. However, many persons who voice their opposition have no direct connection or opportunity to view or enjoy the particular birds that would be killed by lethal control activities. Lethal control actions would generally be restricted to sites already closed to the public and overall DCCO viewing opportunities will still be available. In all instances except Green Island, CDM activities will reduce but not eliminate local DCCO populations. Although DCCO viewing opportunities would be lost at Green Island, similar opportunities would still be available for WSI and TPI. Lethal removal of DCCOs from airports should not affect the public's enjoyment of the aesthetics of the environment since airport properties are closed to public access. The abilities to view and interact with DCCOs at these sites are usually either restricted to viewing from a location outside boundary fences or are forbidden.

In some instances, large roosting or nesting populations of DCCOs can destroy habitat and displace other nesting birds, reducing the aesthetic value for some people. This alternative would reduce negative impacts caused by DCCOs on wildlife species and their habitats including black-crowned night-herons and other colonial waterbirds co-nesting with DCCOs at the sites proposed for CDM. The enjoyment of recreational fishing, and, for some, the opportunity to consume the fish captured, are positive aesthetic values for some people. The USFWS generally does not issue MBPs for the protection of free-swimming fish although exceptions can be made for sites where hatchery fish are released. None of the CDM objectives in Section 1.5.6.3 were established for the protection of fishery resources. However, if there was a need to conduct CDM specifically for the protection of fishery resources, that need could not be met under this alternative. Any adverse impacts of DCCOs on free swimming fish would continue to adversely impact the aesthetic enjoyment of those who value fishery resources.

4.1.5 Humaneness and Animal Welfare Concerns of the Methods Used

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

Impacts would be similar to the no action alternative. Individual perceptions of the humaneness of the Preferred Alternative would be as described for Alternative 5.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Under this alternative, lethal methods viewed as inhumane by some persons would not be used by the Federal agencies. However ODW could still conduct limited amounts of lethal CDM on non-Federal lands for the protection of public resources. In general, people who consider the use of lethal CDM methods inhumane would find this alternative preferable to Alternative 5.

Alternative 3 – Only Technical Assistance by Federal Agencies

Under this alternative, the Federal agencies would not be involved in operational use of CDM techniques. No CDM would be conducted on Federal lands. However lethal CDM techniques could be used by ODW for the protection of public resources on non-Federal lands. Lethal CDM methods could also be used by the state and other non-Federal entities under MBPs. Use of lethal CDM methods would be lower than for Alternatives 1 and 5 because no lethal CDM would be conducted at WSI, but it would still be higher than Alternatives 2 and 4. Individuals who believe lethal CDM techniques are inhumane might consider this alternative slightly preferable to Alternative 5.

Alternative 4 - No CDM by Federal Agencies

Under this alternative the Federal agencies would not be involved in CDM and CDM would not be conducted on Federal lands. ODW could use non-lethal CDM techniques and could still use lower levels of lethal CDM techniques for the protection of public resources on non-Federal lands. Other non-Federal entities could not use lethal CDM techniques but would still have access to non-lethal CDM. Individuals who believe lethal CDM techniques are inhumane are likely to perceive this method as similar to Alternative 2 and more humane than Alternative 5.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Under this alternative, methods viewed by some persons as inhumane would be used in CDM. Shooting, when performed by experienced professionals,

usually results in a quick death for target birds. Occasionally, however, some birds are initially wounded and must be shot a second time or must be caught by hand and then dispatched or euthanized. Some persons would view shooting as inhumane. Some people may also be opposed to killing embryos via egg oiling or egg addling, but this technique is generally viewed as preferable to killing juvenile or adult birds.

Occasionally, DCCOs captured alive would be euthanized. The most common method of euthanasia would be by decapitation, cervical dislocation or CO₂ gas. These methods are described and approved by AVMA as humane euthanasia methods (Beaver et al. 2001).

WS has improved the selectivity and humaneness of management techniques through research and development. Research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some CDM methods are used in situations where non-lethal damage management methods are not practical or effective.

Personnel with the lead and cooperating agencies are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, workforce and funding. Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 3.

4.1.6 Impacts of Carcass Disposal

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

Under this alternative, take of DCCOs and disposal of carcasses would be identical to Alternative 5. For reasons explained for Alternative 5, carcass disposal will not significantly adversely impact soils, water or air quality.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Lethal CDM would not be conducted at WSI so there would be no composting of carcasses at that site. Maximum take of DCCOs by ODW at Green Island and the other Lake Erie islands and near shore areas would be reduced to 270 birds, so impacts at Green Island would be much less than under Alternative 5. There would be no other use of lethal CDM and no other carcass disposal under this alternative. Therefore, based on analysis provided for Alternative 5, the lead and cooperating agencies conclude that this alternative would not have a significant adverse impact on air, soil or water quality.

Alternative 3 – Only Technical Assistance by Federal Agencies

Lethal CDM would not be conducted at WSI so there would be no composting of carcasses at that site. Lethal CDM by ODW under the PRDO and associated impacts relative to carcass disposal would be identical to Alternative 5. Take of DCCOs and disposal of carcasses under MBPs and scientific collecting permits would also be identical to Alternative 5. For reasons provided in Alternative 5, the lead and cooperating agencies conclude that this alternative will not have a significant adverse impact on air, soil or water quality.

Alternative 4 - No CDM by Federal Agencies

Lethal CDM would not be conducted at WSI so there would be no composting of carcasses at that site. Maximum take of DCCOs by ODW at Green Island and the other Lake Erie islands and near shore areas would be reduced to 270 birds, so impacts at Green Island would be less than under Alternative 5. There would be no other use of lethal CDM and no other carcass disposal under this alternative. Therefore, based on analysis provided for Alternative 5, the lead and cooperating agencies conclude that this alternative would not have a significant adverse impact on air, soil or water quality.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

This alternative would result in the lethal take of up to 7,252 DCCOs annually. DCCOs taken by the lead and cooperating agencies for reasons other than the protection of public resources would be disposed of via burial at an Ohio EPA approved sanitary landfill which accepts animal carcasses. The number of DCCOs that could be disposed of in a landfill is insignificant in relation to the total volume of waste that is placed in landfill sites and will not contribute significantly to the impacts associated with these sites. Use of Ohio EPA approved landfills would ensure that disposal actions are conducted in accordance with all State and Federal regulations for the protection of the environment.

The ODW and USFWS would compost all cormorants which are shot on Green Island and WSI onsite. DCCOs taken under the PRDO on other Lake Erie islands and near shore areas would be disposed of in the compost site at Green Island or in a certified landfill. The Ohio EPA has placed the composting of cormorants on the islands under the authority of the Ohio Department of Natural Resources, Division of Soil and Water (ODSW) (pers. communication from Alison Shockley). Under Ohio law, ODW and USFWS employees would attend a mortality composting workshop and be certified by Ohio State University Extension before they begin composting (Keener et al. 2005).

The maximum number of DCCOs that would be placed in the composting sites annually would be 4,766 at WSI (4,626 breeding birds and 140 migrants) and 1,854 at Green Island (1,714 breeding birds from Green Island, 80 breeding birds from TPI, and 60 migrants). Compost areas on Green Island and WSI would not be placed over any likely Lake Erie watersnake hibernacula. Compost sites will also be located > 21 m from the shoreline to prevent disruption of summer habitat potential used by Lake Erie watersnakes. Placement of compost sites at inland locations and compliance with procedures for proper composting of animal carcasses will eliminate any risk that runoff from the site would enter Lake Erie. Additionally a plastic liner will be placed under the compost site to reduce any potential risks to the soil and, in the highly unlikely event that compost would need to be removed from the site, facilitate removal of compost material.

Dead animal composting can be described as "above ground burial in a bio-filter with pathogen kill by high temperature." The decomposition process is anaerobic (lacking oxygen) in and around the animal carcasses, but aerobic in the surrounding material where odorous gases are ingested by microorganisms and degraded to CO₂ and H₂O. The amendment (sawdust) that surrounds the animal carcass or layers of carcasses provides carbon (energy) for the microorganisms and serves as the biofilter (Keener et. al. 2005).

The general procedure followed for composting carcasses is to first construct a base from sawdust or other acceptable amendment at least 30 cm (1 foot) thick. Next, a layer of carcasses is placed on the sawdust base. Then the carcasses are covered with 30 to 60 cm (1 to 2 feet) of damp amendment. The cover material prevents the pile from attracting scavengers and flies, minimizes water leachate in the case of high rainfalls for the uncovered pile, and ensures adequate insulative value for the composting zone to reach 130°F or higher (pathogen kill).

Composting of DCCO carcasses was conducted on Presqu'ile Provincial Park, Ontario in 2004. No complaints were received from the public on the composting area despite the fact that, unlike Green Island and WSI, the public is allowed access to Presqu'ile Provincial Park. Approximately 4,870 DCCOs were composted in a 20m x 20m composting area without adverse impacts on soils, water or air quality (Ontario MNR 2005). A similar or lower number of DCCOs (maximum = 4,766 birds) could be composted at WSI and a much lower number (maximum = 1,854 birds) would be composted at Green Island. The proposed composters will not exceed the size of that used at Presqu'ile (4.5m long, 2.5m wide and 1.5m tall).

At Presqu'ile Provincial Park, the level of mercury in the compost, 2.29 and 3.36 micrograms/gram dry weight exceeded the amount permitted in order to distribute compost, but was not so high that the material had to be removed from the site. The Park could have left the material in the compost site. However, if the material was left on site, the Park was concerned that they would exceed their limit for the amount of material that their permit would allow them to hold at the

compost site and chose to have the compost removed. The material was taken to a conventional landfill in accordance with all applicable regulations.

As stated above, farm animal composting in Ohio falls under the regulation of the Ohio Department of Natural Resources, Division of Soil and Water (ODSW). The Ohio compost areas would not be subject to Canadian regulations regarding the amount of material retained at the site. The compost would remain at the site and would not be distributed, so the agencies are not required to test the compost for the presence of mercury. Nonetheless, the agencies share the public's concern about mercury in the environment and will test the mercury content of the compost and the soil below the compost site at least every other year and more frequently if needed. Based on data from composting at Presqu'île, we anticipate that one year's accumulation of DCCO compost at the Ohio sites will be well below the regulatory mercury limit set by Ohio EPA (0.2 mg/L determined by the Toxicity Characteristic Leaching Procedure - Ohio Administrative Code 3745-51-24). The first test, conducted the second year of the program, will allow the agencies to monitor the consequences of using the same compost site over a period of two years. Results from the test will be used to determine if future testing needs to occur more frequently than every other year and to determine if the agencies need to change or modify carcass disposal procedures. If needed, the agencies will amend this analysis to address changes in environmental impacts and carcass disposal procedures in accordance with NEPA. If an amendment is needed, the public would have the opportunity to review and comment on the new data and proposed procedures.

Based on available data, and given that all composting will be conducted in accordance with guidelines established by the ODSW for the protection of the environment, the proposed composting will not have a significant adverse impact on environmental quality.

4.1.7 Effects on Recreation in Surrounding Area

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Preferred Alternative)

The actions currently planned under this EA would have the same impacts on recreation as Alternative 5, because the CDM actions currently proposed under the PRDO could be conducted under MBPs. It is possible that at some future time, small projects for the protection of public fishery resources could be conducted under this alternative that would not be possible under Alternative 5 so long as the cumulative adverse impacts do not exceed those analyzed in this EA. If the projects to protect fishery resources enhance sport fish populations, then this alternative may have benefits to recreation that would not be possible under Alternative 5.

Alternative 2 – Only Non-lethal CDM by Federal Agencies

Although the total amount of lethal CDM (shooting) that could be conducted would be much lower for non-Federal lands and would not occur on Federal lands, overall impacts on recreation resulting from the use of firearms and pyrotechnics discussed for Alternative 5 may not be lower for this alternative. Increased levels of non-lethal CDM, including the use of pyrotechnics, would probably be needed to achieve management goals. Harassment activities would likely need to be repeated more frequently and for a greater period of time under this alternative than for Alternative 5. If safety buffers are established for these activities like the ones described for Alternative 5, there could be increased closures of the area surrounding the treatment sites to boat traffic. Any potential benefits to sport fishing discussed in Alternative 1 would depend on whether or not the project could be successfully executed when access to the full range of CDM methods is limited.

Alternative 3 – Only Technical Assistance by Federal Agencies

Impacts on recreational activities at non-Federal sites would be similar to or slightly higher under this alternative because ODW would be able to use the full range of CDM methods to achieve CDM goals at non-Federal sites. Risks may be slightly higher because additional CDM may be needed at sites near WSI because of the large, unmanaged DCCO breeding colony at WSI. There would be no CDM conducted at WSI so there would be no impacts on recreational activities conducted near WSI. Overall impacts on recreation are still likely to be low. Any potential benefits to sport fishing discussed in Alternative 1 would depend on whether or not the project could be successfully executed without conducting CDM on Federal lands.

Alternative 4 - No CDM by Federal Agencies

There would be no CDM conducted at WSI so there would be no impacts on recreational activities conducted near WSI. Although the total amount of lethal CDM (shooting) that could be conducted would be much lower for non-Federal lands, overall impacts on recreation resulting from the use of firearms and pyrotechnics discussed for Alternative 5 may not be lower at these sites. Increased levels of non-lethal CDM, including the use of pyrotechnics, would probably be needed to achieve management goals. Harassment activities would likely need to be repeated more frequently and for a greater period of time under this alternative than for Alternative 5. If safety buffers are established for these activities like the ones described for Alternative 5, then increased closures of the area surrounding the treatment sites may result. Additional management efforts may also be needed at sites near the large DCCO colony at WSI that would not be managed under this alternative.

Any potential benefits to sport fishing discussed in Alternative 1 would depend on whether or not the project could be successfully executed without conducting CDM on Federal lands and when access to the full range of CDM methods at other sites is limited.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Impacts on wildlife viewing opportunities are addressed in Section 4.1.4. The DCCO colonies in Ohio are all located on Federal or state-owned properties and surrounded by or adjacent to popular recreational water bodies. Activities by agency personnel under this alternative should have a minimal effect on recreational use because these areas are already closed to public use. However when firearms or pyrotechnics will be used in CMD activities it might be necessary for agency personnel to establish a safe perimeter around the colonies and detour boat traffic away from those areas. In 2005, when research on CDM methods was being conducted at WSI, the USFWS had a marked USFWS boat circling the island during the entire shooting period. The USFWS also broadcast a notice to mariners broadcast over channel 16 VHF radio to warn boaters to stay one mile from the island. The USFWS plans to do the same for all management trips. Similar measures are likely to be used by ODW. As much as possible, these activities would be planned so as not to coincide with heavy recreational use and boat traffic in a given area. Overall impacts on recreation from these protective measures are likely to be minimal. Use of MBPs by private landowners likely would not have any effect on recreation.

4.2 CUMULATIVE IMPACTS

Cumulative impacts, as defined by the CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under the alternatives presented, the lead and cooperating agencies would address damage associated with DCCOs in a number of situations throughout the State. The lead and cooperating agencies would coordinate their efforts and information on the impacts of their activities and the activities of other entities reporting to the USFWS to monitor the cumulative impacts of their actions. The potential cumulative impacts analyzed below could occur either as a result of the lead and cooperating agency CDM program activities over time, or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

Cumulative Impacts on Wildlife Populations

As analyzed in Sections 4.1.1 and 4.1.2, CDM methods used or recommended by the lead and cooperating agencies together with impacts by other entities, will likely have no cumulative adverse effects on DCCO and non-target wildlife populations. The intent and expected result of this program is to prevent the continued loss of rare island vegetation and critical colonial waterbird nesting habitat attributed to the rapid increase in DCCO densities in Ohio. Take of DCCOs by all sources is anticipated to have no effect on the long-term sustainability of DCCO populations in Ohio, the region, and the U.S. Population trend data and information provided in the USFWS FEIS (USFWS 2003) indicate that DCCO populations have increased for Ohio, the region and the U.S. over the past 20 years. When control actions are implemented by the lead and cooperating agencies the potential lethal take of non-target wildlife species is expected to be minimal to non-existent. The potential for beneficial impacts on vegetation, sensitive wildlife populations is greatest for Alternatives 1 and 5 then decreasingly less under Alternatives 2, 3 and 4.

Cumulative Impact Potential from CDM Methods

CDM methods used or recommended by the lead and cooperating agencies may include recommendations on exclusion through use of various barriers (at aquaculture facilities and private fish ponds), habitat modification of structures or vegetation, live trapping and euthanasia of birds, harassment of birds or bird flocks, nest and egg destruction, and shooting. Shotguns would only use shot that does not contain lead to prevent adverse impacts associated with lead in the environment. No cumulative adverse effects are anticipated from implementation of these CDM methods.

4.3 SUMMARY

Under the Preferred Alternative, the lethal removal of DCCOs by the lead and cooperating agencies would not have an adverse impact on the long-term sustainability of DCCO populations in Ohio, the Region or the United States, but some local reductions would occur. Given the SOP's for the protection of nontarget species in Chapter 3 and the lead and cooperating agencies' commitment to adhere to all USFWS and ODW recommendations and requirements for the protection of State and Federally-listed threatened and endangered species, the Preferred Alternative will not adversely impact nontarget species populations. No risk to public safety is expected when the lead and cooperating agencies conduct or recommend CDM because trained and experienced wildlife biologists/specialists would be conducting the work and providing guidance (technical assistance) to others conducting CDM. Potential risks to public safety are slightly higher from persons who reject assistance and recommendations in Alternatives 1, 2, 3 and 5 and conduct their own CDM activities, and when no assistance is provided in Alternative 4. However, overall risks to public safety from the actions of entities other than the lead and cooperating agencies are anticipated to be very low.

Although some persons will likely be opposed to the lead and cooperating agencies conducting CDM activities on public and private lands within the state of Ohio, the analysis in this EA indicates that an Integrated CDM program will not result in cumulative adverse impacts on the quality of the human environment. Table 4-3 summarizes the expected impact of each of the alternatives on each of the issues.

Table 4-3. Summary of impacts of each of the alternatives on each of the issues related to CDM in Ohio.

Issues	<i>Alternative 1 Integrated CDM Program Including PRDO (Preferred Alternative)</i>	<i>Alternative 2 Only Non-lethal CDM by Federal Agencies</i>	<i>Alternative 3 Only Technical Assistance by Federal Agencies.</i>	<i>Alternative 4 No CDM by Federal Agencies</i>	<i>Alternative 5 Integrated CDM, Excluding PRDO (No Action)</i>
Effects on DCCO Populations	Low effect - reductions in local DCCO numbers; would not significantly affect viability of state, regional, national, and continental populations.	No effect by Federal agencies. ODW removal of DCCOs for the protection of public resources would be much lower than Alts 1, 3 and 5. No other lethal CDM would be permitted.	No effect by Federal agencies. Number of DCCOs removed by ODW on non-Federal sites and DCCOs removed under MBPs and research permits could equal that expected under Alts 1 and 5. Total impacts would be lower than Alts. 1 and 5 because there would be no DCCO removal at WSI	No effect by Federal agencies. ODW removal of DCCOs for the protection of public resources would be much lower than Alts 1, 3 and 5. No other lethal CDM would be permitted.	Low effect - reductions in local DCCO numbers; would not significantly affect viability of state, regional, national, and continental populations.

Issues	<i>Alternative 1</i> <i>Integrated CDM</i> <i>Program Including</i> <i>PRDO</i> <i>(Preferred</i> <i>Alternative)</i>	<i>Alternative 2</i> <i>Only Non-lethal</i> <i>CDM by Federal</i> <i>Agencies</i>	<i>Alternative 3</i> <i>Only Technical</i> <i>Assistance by</i> <i>Federal Agencies.</i>	<i>Alternative 4</i> <i>No CDM by</i> <i>Federal Agencies</i>	<i>Alternative 5</i> <i>Integrated CDM,</i> <i>Excluding PRDO</i> <i>(No Action)</i>
Effects on Other Wildlife Species, Including T&E Species	Low effect - methods used by lead and cooperating agencies would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Maximum benefits to species adversely impacted by DCCOs.	Low effect - methods used by lead and cooperating agencies, would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Benefits to species adversely impacted by DCCOs dependent upon efficacy of exclusive use of non-lethal methods at WSI and reduced use of lethal techniques at non-Federal sites.	No effects by Federal agencies. Low effect by ODW - methods used would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Benefits to species adversely impacted by DCCOs on non-Federal lands similar to Alts 1 and 5. No benefit to species adversely impacted by DCCOs at WSI.	No effect by Federal agencies. Low effect by ODW - methods used would be highly selective with very little risk to non-target species. Benefits to species adversely impacted by DCCOs dependent upon efficacy of non-lethal techniques and reduced use of lethal techniques at non-Federal sites. No benefit to species adversely impacted by DCCOs at WSI.	Low effect - methods used by lead and cooperating agencies would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Maximum benefits to species (birds, plants) adversely impacted by DCCOs.
Effects on Human Health and Safety	Negligible risk from methods used by lead and cooperating agencies. Good probability of reducing hazards associated with DCCOs.	Negligible risk from methods used by lead and cooperating agencies. Risk from ODW use of lethal techniques less than low levels anticipated for Alts. 1 and 5. Less likely to reduce hazards associated with DCCOs than Alternatives 1, 3, and 5.	No risk from actions of Federal agencies. Risks from ODW CDM actions on non-Federal lands identical to Alts. 1 and 5. Risks from actions of other entities low but variable depending upon experience. Risks reduced by use of technical assistance. Good probability of reducing hazards associated with DCCOs.	No risk from actions of Federal agencies Risk from ODW use of lethal techniques less than low levels anticipated for Alts. 1 and 5. Less likely to reduce hazards associated with DCCOs than Alternatives 1, 3, and 5.	Negligible risk from methods used by lead and cooperating agencies. Good probability of reducing hazards associated with DCCOs.

Issues	<i>Alternative 1 Integrated CDM Program Including PRDO (Preferred Alternative)</i>	<i>Alternative 2 Only Non-lethal CDM by Federal Agencies</i>	<i>Alternative 3 Only Technical Assistance by Federal Agencies.</i>	<i>Alternative 4 No CDM by Federal Agencies</i>	<i>Alternative 5 Integrated CDM, Excluding PRDO (No Action)</i>
Aesthetic Impacts	Low to moderate effect at local levels; Some local populations may be reduced. DCCO viewing opportunities would still be available Best potential for localized benefits to those who enjoy species that may be adversely impacted by DCCOs.	Low to moderate effect. Impact will depend on success of efforts to relocate problem DCCOs with non-lethal techniques and success of limited ODW use of lethal CDM methods to protect public resources on non-Federal lands Localized benefits to those who enjoy species that may be adversely impacted by DCCOs variable depending on efficacy of non-lethal techniques.	No effect by Federal agencies Impact of entities other than WS and USFWS would be similar to Alts 1 and 5 on non-Federal lands. Benefits to those who enjoy species adversely impacted by DCCOs on non-Federal lands similar to Alts. 1 and 5. No localized benefits to those who enjoy species adversely impacted by DCCOs at WSI because CDM efforts to protect public resources would not be conducted at WSI.	No effect by Federal agencies. Impact of other entities will depend on success of efforts to relocate problem DCCOs with non-lethal techniques and success of limited ODW use of lethal CDM methods to protect public resources. Localized benefits to those who enjoy species that may be adversely impacted by DCCOs on non-Federal lands variable depending on efficacy of ODW efforts.	Low to moderate effect at local levels; Some local populations may be reduced. DCCO viewing opportunities would still be available Best potential for localized benefits to those who enjoy species that may be adversely impacted by DCCOs.
Humaneness and Animal Welfare Concerns of Methods Used	Low to moderate effect - methods viewed as inhumane (lethal CDM methods) by some people would be used by lead and cooperating agencies. Same number of DCCOs taken as Alternative 5.	Lower effect than Alt. 5 because only non-lethal methods would be used by entities other than ODW. Use of lethal methods by ODW greatly reduced.	No effect by Federal agencies. Lethal available to other entities but fewer DCCOs would be taken than under Alternative 5 because no lethal used at WSI.	No effect by Federal agencies. No use of lethal by any entity other than ODW. Use of lethal methods by ODW greatly reduced.	Low to moderate effect - methods viewed by some people as inhumane (lethal CDM methods) would be used by lead and cooperating agencies.
Carcass Disposal	Low effects because disposal actions will be conducted in accordance with state and Federal laws and regulations. Impacts same as Alt 5.	Effects lower than Alts 1,3, and 5 because lowest used of lethal CDM methods. Identical to Alt 4.	Effects lower than alts 1 and 5 because less use of lethal CDM methods.	Effects lower than Alts 1,3, and 5 because lowest used of lethal CDM methods. Identical to Alt 2.	Low effects because disposal actions will be conducted in accordance with state and Federal laws and regulations.

Issues	<i>Alternative 1 Integrated CDM Program Including PRDO (Preferred Alternative)</i>	<i>Alternative 2 Only Non-lethal CDM by Federal Agencies</i>	<i>Alternative 3 Only Technical Assistance by Federal Agencies.</i>	<i>Alternative 4 No CDM by Federal Agencies</i>	<i>Alternative 5 Integrated CDM, Excluding PRDO (No Action)</i>
Effects on Recreation in the Surrounding Areas	Low impacts on recreation Benefits from potential future projects to benefit sport fishing greatest for this alternative	Less lethal CDM but not necessarily less impact on recreation Benefits from potential future projects to benefit sport fishing dependent upon efficacy of non-lethal methods and reduced access to lethal CDM methods	Less lethal CDM but not necessarily less impact on recreation at non-Federal sites. No impacts at Federal sites Benefits from potential future projects to benefit sport fishing dependent upon whether goals can be accomplished at non-Federal sites	Less lethal CDM but not necessarily less impact on recreation at non-Federal sites. No impacts at Federal sites Benefits from potential future projects to benefit sport fishing dependent upon whether goals can be accomplished at non-Federal sites and efficacy of programs with restricted access to CDM methods.	Low impacts on recreation. Future projects to benefit sport fishing would be extremely limited.

CHAPTER 5: LIST OF PREPARERS AND PERSONS CONSULTED

Tara E. Baranowski, Wildlife Technician	USDA, APHIS, Wildlife Services
Doug Brewer, Refuge Manager	USFWS, ONWR
Jonathon D. Cepek, District Supervisor	USDA, APHIS, Wildlife Services
Shauna Hanisch, Wildlife Biologist	USFWS
Ron Huffman, Wildlife Biologist	USFWS, ONWR
Roger Knight, Fisheries Program Administrator	ODNR, Division of Wildlife
Rachel Levin, Public Affairs Specialist	USFWS
Steve Lewis, Regional Nongame Bird Coordinator	USFWS
Andy J. Montoney, State Director	USDA, APHIS, Wildlife Services
Dave Risley, Executive Administrator	ODNR, Division of Wildlife
David E. Sherman, Wildlife Biologist	ODNR, Division of Wildlife
Mark Shieldcastle, Wetland Research Project Leader	ODNR, Division of Wildlife
Jeff Tyson, Fisheries Biology Supervisor	ODNR, Division of Wildlife
Chris Vandergoot, Fisheries Biologist	ODNR, Division of Wildlife
Kimberly Wagner, Environmental Coordinator	USDA, APHIS, Wildlife Services
Angela Zimmerman, Endang. Species Coord.	USFWS, Ohio Ecological Services Field Office